

## CHAPTER 10

### PREVENTATIVE MAINTENANCE

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#### 10-1. Rationale for maintenance

Preventative maintenance of roads, streets, hardstands, and runways should provide a means to detect early any apparent deterioration of the structure. Early detection and maintenance may not entirely eliminate the requirements of eventual replacement of the surfaced area, but will be a major factor in lengthening its life and reducing maintenance and repair problems and costs. Adequate preventative maintenance results in more efficient, economical operations. In order for such a program to be successful, a knowledge of what causes early deterioration is required. It is the responsibility of the surfaced area maintenance supervisor to assign qualified personnel to perform the necessary inspections. The maintenance crewmen are responsible for correcting minor defects and reporting them to their supervisor.

#### 10-2. Inspection and records

The roads, streets, hardstands, and runways that an installation has to manage should be divided according to makeup, location, and frequency to use. These areas are normally coded in such a manner as to make them readily identifiable. A pavement management system will provide a method of procedure for inspection of pavement condition, cause and repair method, economic analysis, and data management. The system as a minimum should relate a description of the area, date of inspection, recommended maintenance, and work accomplished. These cards may be color coded, flagging the card for frequency of inspections. By having a precise history of the surfaced area, planning maintenance and assigning of funds may be accomplished more economically. Any unusual or major incidents which would affect maintenance or usage of facilities should be noted.

*a. Unpaved roads.* Unpaved roadway surfaces should be maintained in a smooth well-drained condition to prevent rutting, potholes, and similar irregularities. Inspection of unsurfaced roads will be made at frequent intervals, and additional inspections will be made after heavy storms with special emphasis on drainage problems. Extremely dry weather will also require additional care to prevent surface degradation. Unsurfaced areas should be repaired immediately to avoid extreme damage in wet or dry conditions.

*b. Paved areas.* Guidance concerning pavement maintenance management and pavement condition surveys for paved surface can be found in TM

5-623. Information concerning pavement condition surveys for airfields can be found in TM 5-826-6/ AFR 93-5.

(1) Concrete pavements are examined for cracks induced by loading, expansion, or other causes. These cracks need to be sealed with joint sealer that meets applicable specifications. If new cracking is discovered, frequent observations to determine the cause should be made so that corrective measures may be taken before spalling or other problems become widespread. A check for pumping and settlement should also be made. All drainage features should be observed so that early corrective maintenance can be performed. Examination of area should also note any scaling, spalling, disintegration, or other types of failures. Spalling normally occurs at joints, corner breaks, or any area where cracks have appeared. Causes should be determined and steps taken to remove and replace deficient areas. Supporting foundations and structures appurtenant to concrete pavements should also be inspected. Early observation of signs of distress will permit immediate correction before serious failure occurs.

(2) Flexible or asphalt pavement surfaces require about the same inspection and action as do rigid or concrete surfaces. Cracks should be noted, their cause determined, and then sealed by proper method and material. Weathering is caused by oxidation from the effects of air, water, and sun. This condition is normally determined during very dry weather and is usually indicated by loss of color, fine surface cracking, and brittleness. Raveling should be controlled immediately to eliminate loose material detrimental to the use of the area. Bleeding is usually caused by too much bitumen and normally occurs in hot weather. These areas should be sprinkled with sand to eliminate the slick hazardous surfaces. Potholes need immediate attention to prevent serious traffic hazards and possible damage to the base and subgrade. Settlement and depressions may be caused by inadequate or defective drainage. Careful inspection will determine the cause so that proper maintenance can be performed.

*c. Shoulders and roadsides.* These areas also require inspection because proper functioning of them has a direct bearing on drainage and stability of the adjacent pavement. Severe failures such as slides may be prevented by early detection and minimum maintenance.

*d. Drainage system.* The inspection should include looking for debris, cave-ins, and other stoppages. The systems should be checked for peak load

requirements during storms and any inadequacies should be noted. Culverts, inlet headwalls, and exits need to be checked for possible erosion, settlement, and wash. Minor changes and additions may prevent serious and expensive maintenance or repairs.

e. *Bridges.* Signs of deterioration such as rust in metal structures, damage and decay in wood, and cracking, spalling, and chemical damage in concrete should be checked. Minor repairs and maintenance will prolong usable life of structures before major repairs become necessary. Personnel required to make inspections of bridges should have some experience relating to construction and maintenance of bridges.

### **10-3. Maintenance strategies and performance of paved roads**

The methods, materials, and procedures given are those which can be used on pavements to extend the life of the pavements. These may be applied even though the pavement surface shows no distress.

These practices will extend the useful life of the pavement.

a. *Rejuvenators.* Rejuvenators (see chap 3) are

products that can be applied to asphalt pavements to modify the asphalt properties to approximately those of a new asphalt.

b. *Fog seal.* A fog seal (see chap 3) is a spray application using an emulsified asphalt. It is a light coating sprayed on various asphalt surfaces to seal voids in the pavement surface or bind loose aggregate to the surface.

c. *Slurry seals and bituminous surface treatments.* Slurry seals and bituminous surface treatments (see chap 3) can provide effective wearing surfaces for asphalt pavements exhibiting surface distress.

d. *Joint and crack sealing.* See chapters 3 and 4 for details on joint and crack sealing for asphalt and concrete pavements. By keeping all joints and cracks sealed, the amount of water penetrating into and under the pavement is minimized.

e. *Undersealing.* Undersealing (see chap 4) is used to fill voids to help stabilize slabs which have been undermined usually by pumping or some water action. This will help prevent the slabs from cracking or breaking by filling voids and preventing water from getting into and weakening the subbase.